

MONTGOMERY COUNTY BRIDGE 221  
(Metz Road Bridge)  
Metz Road spanning Towamencin Creek,  
approximately 1.1 miles north of  
Traffic Route 73 (Skippack Pike)  
Skippack vicinity  
Montgomery County  
Pennsylvania

HAER No. PA-308

HAER  
PA  
46-SKIPPACK  
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
Northeast Region  
Philadelphia Support Office  
U.S. Custom House  
200 Chestnut Street  
Philadelphia, PA 19106

# HISTORIC AMERICAN ENGINEERING RECORD

## MONTGOMERY COUNTY BRIDGE 221 (Metz Road Bridge)

HAER No. PA-308

HAER  
PA  
46-SKIPP.V  
1-

Location: Metz Road spanning Towamencin Creek, approximately 1.1 miles north of Traffic Route 73 (Skippack Pike), Skippack vicinity, Montgomery County, Pennsylvania.  
UTM Coordinates: 18.469060.4453000  
Quad: Lansdale, PA

Builder: John Denithorn & Son, Co. (Steel Contractor)  
James Walsh (Masonry Contractor)

Fabricator: Phoenix Iron Co. Phoenixville, Pennsylvania

Date of Construction: 1896 (Altered 1960)

Present Owner: County of Montgomery. Norristown, Pennsylvania

Present Use: Vehicular and pedestrian bridge.

Significance: Montgomery County Bridge 221, is an excellent example of a single span, steel, Pratt pony truss bridge constructed in the latter part of the 19th century. It embodies the characteristics of the type and method of construction employed during that period. The bridge superstructure was manufactured and erected by the John Denithorne & Son, Co., a major supplier of bridges in southeastern Pennsylvania. Steel for the bridge came from the Phoenix Iron Co.

Project Information: The Montgomery County Department of Road and Bridges will undertake the replacement of County Bridge 221 in 1998. The Pennsylvania State Historic Preservation Officer determined in 1993 that the bridge was eligible for listing on the National Register of Historic Places. This documentation was undertaken by the County of Montgomery in accordance with a request from the Bureau for Historic Preservation at the Pennsylvania Historical and Museum Commission. The recordation serves as a mitigation measure prior to the replacement of the bridge.

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Document prepared: November 1997

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### Bridge History

On March 5, 1894 a group of residents in Towamencin Township petitioned the Court of Quarter Sessions of Montgomery to construct a bridge over Towamencin Creek. The petition, in part, reads as follows:

*Upon the Petition of divers inhabitants of the township of Towamensing [sic] and parts adjacent in said county -- setting forth, That a bridge is much needed over Towamensing [sic] Creek at the place where the public highway at the junction of two public roads, one leading from the Morris Road at Weiermans to the Skippack Road and an other public road leading to the forty foot road, at the lands of Jacob C. Stover and late Charles Smith and Adam H. Schlosser) cross said Creek in the said Township, the ford there being frequently rendered impassable by reason of ice and high water; and that the expense of erecting said bridge would be too heavy and burdensome upon the inhabitants of said Township. Your petitioners therefore pray the Court to appoint proper persons to view the premises and to take such order on the subject as is required and directed by the Act of General Assembly in such cases made and provided.*

Prior to the construction of Montgomery County Bridge 221 in 1896, travelers within the project area used two fords to cross Towamencin Creek. One ford was located several hundred feet upstream of the current bridge and was on a road which connected two major travelways in Montgomery County: Skippack Pike to the south and Sumneytown Pike to the north. The other ford, located several hundred feet south of the current bridge was on a public road leading from Hendrick's Store to the Springhouse and Sumneytown Turnpike. The construction of County Bridge 221 provided for an all weather crossing of Towamencin Creek, thereby improving the transportation system, not only for this part of Towamencin Township but for much of central Montgomery County.

The road plan which accompanied the resident's petition ("Plan from *Petition for Proposed Bridge*, October 15, 1894) shows the location of the two fords and the proposed bridge location.

Documents showing the appointment of viewers, or outlining their report to the court could not be found in the Montgomery County archives. The viewers apparently agreed with the petitioners that a structure should be constructed, and the court apparently concurred with the findings of the viewers.

The minutes of the County Commissioner's meeting of May 6, 1896 reads, in part, ... *In motion the Board unanimously decided to build the following bridges, to wit...one over the Towamencin Creek in the Township of Towamencin.*

The proposals for the five bridges was advertised in the May 18, 1896 edition of the Norristown Weekly Herald.

On June 17, 1896 the commissioners met and accepted bids for five bridges, one of which was the Towamencin Creek bridge. The bridge, being a metal truss bridge, was let as two contracts: one for the "Iron Work" and the other for "Masonry". The following bids were received for the superstructure:

<i>Massilon Bridge Co.</i>	<i>\$ 879</i>
<i>Denithorne &amp; Sons</i>	<i>850</i>
<i>Groton Bridge Co.</i>	<i>944</i>
<i>New Berlin Bridge Co.</i>	<i>1,220</i>
<i>King Bridge Co.</i>	<i>800</i>
<i>Benner &amp; Opdyke</i>	<i>1,308</i>
<i>Horsehead Bridge Co.</i>	<i>1,120</i>

The county commissioners awarded the bridge contract at their June 22, 1896 meeting. The contract was awarded to Denithorne & Sons. While the company was not the lowest bidder on the Towamencin Creek bridge, the county grouped four of the bridges under one contract and Denithorne & Sons submitted the lowest total cost for the four projects. The total contract amount for these four bridges was \$4,355.

There was only one bid submitted for the masonry component of the project. That bid, in the amount of \$951.15, was received from *James Walsh*.

A newspaper article on the bid opening was included in the June 22, 1896 edition of the Norristown Weekly Herald.

On November 10, 1896 a three-man board of viewers was appointed to inspect the workmanship of the newly constructed bridge. The viewers reported on November 23, 1896 that they inspected the various bridges and that they were of the opinion that "... *workmanship thereof is in conformity with the contracts*". They did report however, that in many instances the iron or steel was of smaller dimension than was called for on the construction plans. The viewers went on to say that the Montgomery County Engineer, Alan W. Corson, informed them that he had approved the material changes prior to the time of construction.

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On November 25, 1896, William Springer, Supervisor in Towamencin Township gave notice to the Montgomery County Commissioners that *"..the road lately laid out in Towamensing [sic] Township, over land of Jacob C Stover et al. and crossing the new Iron Bridge near Cooker's Mill is now open and in repair for Public travel."*

As it now sits, Montgomery County Bridge 221 has not been altered since the time of its initial construction except for a deck replacement completed in 1960, and the addition of "C" channel steel railings (no date available). No modifications have been made to the structural members in order to increase the bridge's load carrying capacity.

### Bridge Description

Montgomery County Bridge 221 over Towamencin Creek in Skippack vicinity, is located on Metz Road approximately 5 miles northeast of the Borough of Collegeville. The bridge is just outside the limits of Evansburg State Park. In 1993 the bridge was closed to traffic due to the deterioration of numerous structural components.

The bridge is a single span Pratt style pony truss measuring approximately 74'. The trusses are comprised of five interior panels, each 10'4" wide, and full slope end panels. The truss members extend to a height of approximately 9'7" above the deck. The total roadway clearance between the trusses is approximately 15'. The top chord and end posts are covered with a solid plate on the top and "X"-braced with 1-1/2" x 1/4" x 18" bar stock approximately 41" center to center along the bottom. The top chord is spliced at mid span with plate and eight (8) bolts. The vertical columns are reinforced with lacing. The trusses bear on 3' x 4' x 12" granite blocks.

The diagonals are composed of both 1"-1/8" square bar stock and 7/8" diameter rod stock. All the diagonal members have loop welded end connections. The rod diagonals at panels 2 and 4, as well as the 1" square diagonals at the mid-panel contain turnbuckles for tension adjustment. The bottom chord is composed of 1" square bar stock with loop welded end connections. The bottom chord consists of two members on the end panels and panels 1 and 5. On the three middle panels, the chord is comprised of three members. The pins at the connection points are 2" in diameter. The pin connections have not been altered.

The current deck was installed in 1960. It is composed of a steel pan covered with bituminous paving. There are three 2" x 6" "C" channel steel railings on the bridge. The lower railing is a deck level and serves as a wheel guard. The top rail is approximately 44" above the deck. When first constructed, the bridge had steel lattice railings attached to each truss.

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The abutments and wing walls are made of a mixture of red and gray sandstone laid up in a semi-coursed rubble pattern. The abutments are approximately 21'2" in width. The south abutment has been reinforced on the sides and face with stone approximately 18" thick. It has been capped with a thin layer of concrete. The north abutment has not been altered. The wing walls are 24" thick and topped with gray sandstone caps, 28" wide and 4" thick. The wing walls on the south approach are approximately 19' to 20' in length and the parapets vary from 30" to 39" in height. The first 4' to 5' of the walls extend parallel to the bridge. The clearance between this portion of the walls is 17'6". The remainder of the walls then flair to provide a clearance of 37' at the ends. The wing walls on the north approach are 34' to 36' in length. Due to the steep roadway grade on this approach, the walls are stepped. The end 8' of the walls is stepped approximately 22". The parapets are 37" high at the end of the bridge. The parapet height is approximately 37" at the bridge end and 55" before the step. The walls flair from 18' wide at the bridge to a width of 28'6" at their ends.

Located on the southeast parapet is a 24" x 40" stone plaque. The plaque reads:

Built By  
Montgomery County  
1896

S.K.Anders  
C.M.Reed                      Commissioners  
M.G.Erb  
Edw.Elsenhans, Clerk

Jas.Walsh                      Alan W.Corson  
Contractor                      Engineer

### The Pratt Truss

The Pratt truss was originally patented by Thomas and Caleb Pratt in 1844. In their original form the trusses were constructed as composite structures using a combination of wood and cast iron members. In their final configuration, the trusses were constructed as all metal bridges. The Pratt Truss was the first scientifically designed truss bridge in America.

The Pratt truss was accepted only reluctantly by railroad engineers when it was first introduced in the mid-19th century. However, by the 1870's the truss design had gained national favor. Later, in modified and improved form, the Pratt Truss became the standard all-steel bridge for America's highways and railroads.

### James Walsh - Masonry Contractor

The contractor for the abutments and wing walls on the Metz Road bridge was James Walsh. Mr. Walsh, an Irish immigrant, was born in 1839. In 1850, at the age of 11, he and his parents immigrated to America. He subsequently became a naturalized citizen. James Walsh died June 20, 1900.

In *Boyd's Directory of Norristown - Names of Citizens*, James Walsh was listed as a "City Contractor" in the 1890-92 through 1900-02 editions. The 1900 United States Census, which was enumerated two weeks before his death, lists his occupation as "Contractor".

Research undertaken as part of this bridge recordation project included a review of the minutes of the Montgomery County Commissioners meetings for the years 1885 through 1900. This review revealed that James Walsh apparently was not a major contractor for county projects.

Except for his work on the Metz Road bridge, Walsh's name appears as a bidder on only one other bridge project, in 1898. In that case he was not the low bidder. His name does not appear as a bidder for other construction projects which Montgomery County undertook during the final decade of the 19th century.

### John Denithorne & Son - Iron Contractor

John Denithorne & Son of Phoenixville, Pennsylvania, manufactured and erected the Metz Road bridge. The firm was owned and operated by John Denithorne along with his son William.

John Denithorne was born in Cornwall, England in 1834. As a child of 13, he immigrated to America with his mother and father. The family settled near Pottsville, Pennsylvania where Denithorne eventually apprenticed to learn the trade of boilermaker. Following his apprenticeship, he moved to Phoenixville where he accepted a position with the Phoenix Iron Company. Denithorne eventually became the supervisor of the company's boiler shop.

In 1877, John Denithorne, along with his brothers Richard and James, opened a shop in Phoenixville for the purpose of manufacturing and repairing boilers. They traded under the name of "Denithorne Bros.". For the first several years of operation, Denithorne Bros. manufactured tanks and boilers. A newspaper article in 1880 announced that the firm had been awarded a contract for the construction of an iron bridge. The article stated that.. "*These gentlemen are gaining quite an extensive reputation for their bridges, which are neat, strong, and durable*". The brothers continued their partnership until the early 1880's. At this time, Richard and James, who were primarily stone masons, decided to undertake outside contracting. This left John to continue operation of the iron fabrication business. The firm operated under the name of John Denithorne & Son. Between 1883 and 1898 the firm fabricated and constructed many iron truss bridges in southeastern Pennsylvania. Over 50 of the firm's bridges have been documented in

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Montgomery and Chester Counties alone. Documentation shows other bridges having been constructed in Pike, Philadelphia, and Lancaster Counties, Pennsylvania, as well as Laurel, Maryland. The bridges being constructed were primarily Pratt pony trusses. A small number of thru trusses were also constructed. The material used to fabricate their structures was primarily obtained from the Phoenix Iron Company. Denithorne's fabricating yard was located at the corner of Bridge and Church Streets in Phoenixville on property leased from the Phoenix Iron Company. In 1887, John Denithorne moved his operation to a parcel of land located along the Schuylkill River just outside of Phoenixville Borough.

John Denithorne became one of the most prominent citizen within the Borough of Phoenixville during the last three decades of the 19th century. Part of his stature in the community was derived from his military service. His first military service was during the 1850's as a member of the "Minersville Artillery", a unit composed of men from Pennsylvania's hard coal region. Following several years of service with this unit, he was honorably discharged. Wanting more authority in the administration of a military unit, Denithorne organized an infantry company known as the "Ellsworth Rifles". This unit was located in Bedford County, Pennsylvania. He served as an officer in this military unit until moving to Phoenixville in 1860.

With the outbreak of the Civil War, Denithorne again enlisted in the military. During the initial war years, he was not pressed into active duty. Instead, he became a gun maker at the Phoenix works and assisted in the manufacture of the "Griffin" gun, a prominent cannon used by the Union forces. When Lee's army invaded Pennsylvania in late June 1863, Denithorne organized an emergency company of men and marched to Harrisburg, Pennsylvania to receive further orders. He was elected "captain" of this unit. By the time he and his company had reached the state capital, Lee's army had been defeated at Gettysburg. Because many of the men in the company were employed making armaments at the Phoenix works, the company was ordered back to Phoenixville. They could best serve the war effort by manufacturing cannon. Following the return to Phoenixville, John Denithorne was made superintendent of the cannon fabrication shops of the Phoenix Iron Works.

In 1871, Denithorne was elected Captain of Battery C, an artillery unit of the Pennsylvania National Guard located in Phoenixville. This unit saw service during periods of labor unrest in the late 19th century. These included railroad riots in Pittsburgh and the iron workers riot in Homestead, Pennsylvania. The unit was also dispatched to Hazelton, Pennsylvania to, as one of his obituaries reads, "...*preserve order among the coal miners*". Throughout the remainder of his life he was referred to as "Captain Denithorne".

In 1894 John Denithorne was elected "Burgess" (mayor) of Phoenixville. He served in this capacity for the next three years until his death in 1897.

Following his death, his son lost interest in continuing the business. The company ceased operation before 1900.



SOURCES OF INFORMATION / BIBLIOGRAPHY

A. **ENGINEERING DRAWINGS:** None

B. **HISTORIC VIEWS:** None

C. **INTERVIEWS:**

Robert M. Deger, III, Personal interview. Mr. Deger is the great grandson of John Denithorne. Kimberton, PA. 1996.

D. **BIBLIOGRAPHY:**

**1. Primary Sources**

Minutes of the County Commissioners - 1875 through 1900. Norristown, PA. Montgomery County Archives.

Plan from *Petition for Proposed Bridge*, October 15, 1894. Roads and Bridges, "PUC Old Files". Norristown, PA. Montgomery County Archives.

United States Census - 1900. Norristown, PA. Montgomery County Historical Society.

**2. Secondary Sources**

Boyd's Directory of Norristown - Names of Citizens (1890 through 1902 editions), Norristown, PA. D. M. Yost & Co. Norristown, PA. Montgomery County Historical Society.

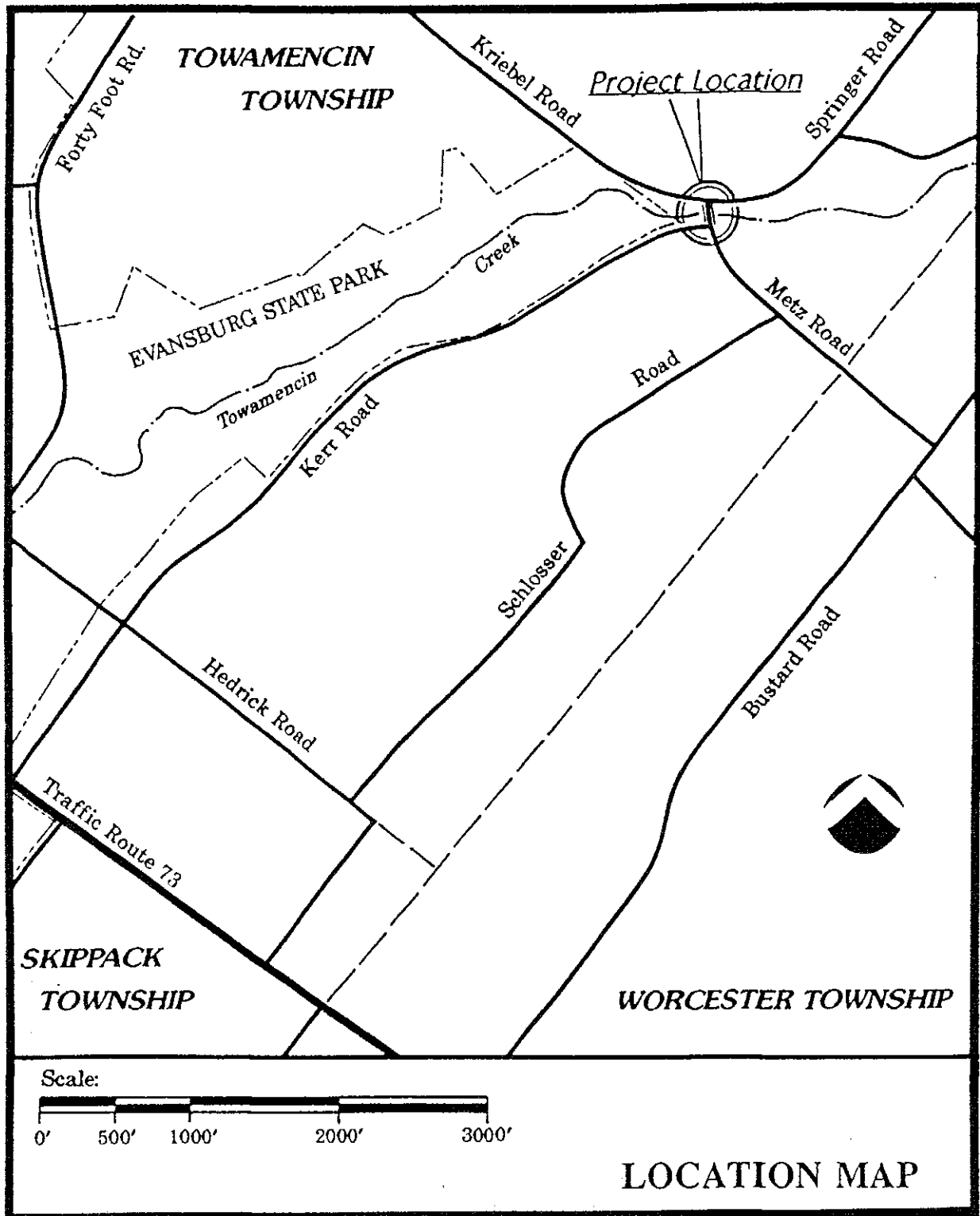
Business Review of Chester County, Philadelphia. Pennsylvania Publishing Co., 1890. West Chester, PA. Chester County Historical Society.

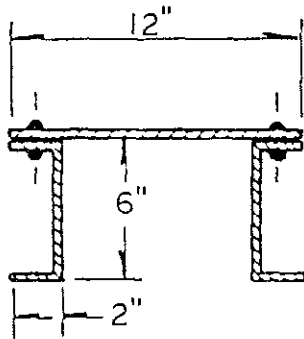
Chester County and Its People, Chicago & New York. The Union History Company, c.1895. West Chester, PA. Chester County Historical Society.

Phoenix Steel Corporation, Phoenix Steel Corporation Collection, Accession 916. Wilmington, DE. Hagley Museum Library.

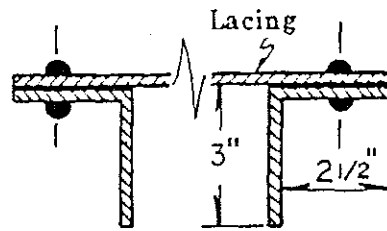
Wiley, Samuel T., Biographical and Portrait Cyclopedic of Chester County Pennsylvania. Philadelphia. Gresham Publishing Company, 1893. West Chester, PA. Chester County Historical Society.

E. **SUPPLEMENTAL MATERIAL:** None

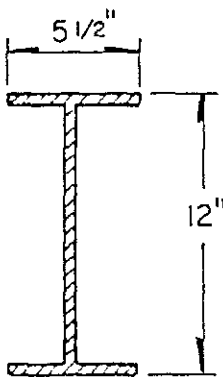




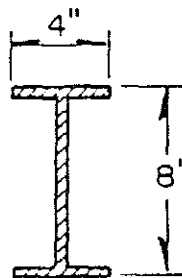
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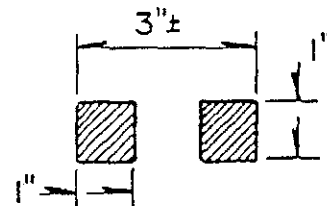
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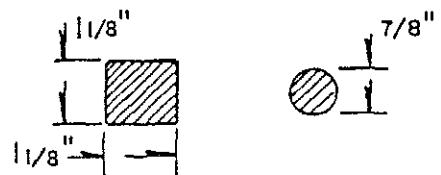
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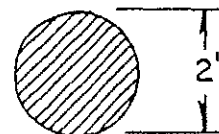
STRINGER  
(Total of 8)



BOTTOM CHORD



DIAGONALS



PIN CONNECTION

DIMENSIONS OF STRUCTURAL MEMBERS

